

CLAIMS

1. Masking device for a flat-screen colour-display cathode-ray tube, of the type comprising a support frame for a tensioned shadow mask and a tensioned shadow mask mounted on the support frame so as to be subjected to tension at room temperature, characterized in that:
- the support frame is made of a hardened Fe-Ni alloy having a thermal expansion coefficient between 20°C and 150°C of less than $5 \times 10^{-6} \text{ K}^{-1}$ and a yield stress $R_{p0.2}$ at 20°C of greater than 700 MPa;
 - the tensioned shadow mask is made of an Fe-Ni alloy having a thermal expansion coefficient between 20°C and 150°C of less than $3 \times 10^{-6} \text{ K}^{-1}$;
- the hardened Fe-Ni alloy of which the support frame is made and the Fe-Ni alloy of which the shadow mask is made being chosen in such a way that:
- below a temperature T_1 , the mean expansion coefficient α_{20-T} , between 20°C and the temperature T, of the hardened Fe-Ni alloy of which the support frame is made is greater than the mean expansion coefficient α_{20-T} , between 20°C and the temperature T, of the Fe-Ni alloy of which the shadow mask is made,
 - above the said temperature T_1 , the mean expansion coefficient α_{20-T} , between 20°C and the temperature T, of the hardened Fe-Ni alloy of which the support frame is made is less than the mean expansion coefficient α_{20-T} , between 20°C and the temperature T, of the Fe-Ni alloy of which the shadow mask is made, and
 - the said temperature T_1 is less than 350°C and preferably less than 300°C.
2. Device according to Claim 1, characterized in that the hardened Fe-Ni alloy of which the support frame is made is an Fe-Ni alloy of the "γ'-hardened" type whose chemical composition comprises, by weight:

$$40.5\% \leq \text{Ni} + \text{Co} + \text{Cu} \leq 43.5\%$$

$$0\% \leq \text{Co} \leq 5\%$$

$$0\% \leq \text{Cu} \leq 3\%$$

$$1.5\% \leq \text{Ti} \leq 3.5\%$$

5 $0.05\% \leq \text{Al} \leq 1\%$

$$\text{C} \leq 0.05\%$$

$$\text{Si} \leq 0.5\%$$

$$\text{Mn} \leq 0.5\%$$

$$\text{S} \leq 0.01\%$$

10 $\text{P} \leq 0.02\%$

the balance being iron and impurities resulting from the smelting,

and the Fe-Ni alloy of which the shadow mask is made is an Fe-Ni alloy whose composition comprises, by weight:

15 $32\% \leq \text{Ni} + \text{Co} + \text{Cu} \leq 37\%$

$$0\% \leq \text{Co} \leq 5.5\%$$

$$0\% \leq \text{Cu} \leq 2\%$$

$$0\% \leq \text{Nb} + \text{Ta} + \text{Mo} + \text{W} + \text{Zr} \leq 2\%$$

$$0 \leq \text{Mn} \leq 0.5\%$$

20 $\text{Si} < 0.2\%$

$$\text{C} < 0.02\%$$

$$\text{S} < 0.01\%$$

$$\text{P} < 0.02\%$$

the balance being iron and impurities resulting from the smelting.

3. Device according to Claim 2, characterized in that the chemical composition of the Fe-Ni alloy of which the shadow mask is made is such that:

$$32\% \leq \text{Ni} + \text{Co} + \text{Cu} \leq 35.5\%$$

30 $0\% \leq \text{Co} \leq 4\%$

$$0\% \leq \text{Cu} \leq 2\%$$

$$0\% \leq \text{Nb} + \text{Ta} + \text{Mo} + \text{W} + \text{Zr} < 0.2\%.$$

4. Device according to Claim 2, characterized in that the chemical composition of the Fe-Ni alloy of which the shadow mask is made is such that:

$$33.5\% \leq \text{Ni} + \text{Co} + \text{Cu} \leq 37\%$$

$$0\% \leq \text{Co} \leq 5.5\%$$

$$0\% \leq \text{Cu} \leq 2\%$$

$$0.2\% \leq \text{Nb} + \text{Ta} + \text{Mo} + \text{W} + \text{Zr} \leq 2\%.$$

5. Device according to Claim 1, characterized in that the hardened Fe-Ni alloy of which the support frame is made is an Fe-Ni alloy of the "γ'-hardened" type whose chemical composition comprises, by weight:

$$\begin{aligned} 43.5\% &\leq \text{Ni} + \text{Co} + \text{Cu} \leq 45.5\% \\ 0\% &\leq \text{Co} \leq 5\% \\ 0\% &\leq \text{Cu} \leq 3\% \\ 1.5\% &\leq \text{Ti} \leq 3.5\% \\ 0.05\% &\leq \text{Al} \leq 1\% \\ \text{C} &\leq 0.05\% \\ \text{Si} &\leq 0.5\% \\ \text{Mn} &\leq 0.5\% \\ \text{S} &\leq 0.01\% \\ \text{P} &\leq 0.02\% \end{aligned}$$

the balance being iron and impurities resulting from the smelting.

and the Fe-Ni alloy of which the shadow mask is made is an Fe-Ni alloy whose chemical composition comprises, by weight:

$$\begin{aligned} 35.5\% &\leq \text{Ni} + \text{Co} + \text{Cu} \leq 37\% \\ 0\% &\leq \text{Co} \leq 5.5\% \\ 0\% &\leq \text{Cu} \leq 2\% \\ 0 &\leq \text{Mn} \leq 0.5\% \\ \text{Si} &< 0.2\% \\ \text{C} &< 0.02\% \\ \text{S} &< 0.01\% \\ \text{P} &< 0.02\% \end{aligned}$$

the balance being iron and impurities resulting from the smelting.

6. Tensioned shadow mask, characterized in that the chemical composition of the Fe-Ni alloy is such that:

$$\begin{aligned} 32\% &\leq \text{Ni} + \text{Co} + \text{Cu} \leq 35.5\% \\ 0\% &\leq \text{Co} \leq 4\% \\ 0\% &\leq \text{Cu} \leq 2\% \end{aligned}$$

$$0\% \leq \text{Nb} + \text{Ta} + \text{Mo} + \text{W} + \text{Zr} < 0.2\%.$$

7. Tensioned shadow mask, characterized in that the chemical composition of the Fe-Ni alloy is such that:

$$33.5\% \leq \text{Ni} + \text{Co} + \text{Cu} \leq 37\%$$

$$0\% \leq \text{Co} \leq 5.5\%$$

$$0\% \leq \text{Cu} \leq 2\%$$

$$0.2\% \leq \text{Nb} + \text{Ta} + \text{Mo} + \text{W} + \text{Zr} \leq 2\%.$$

- 5 8. Device according to Claim 1, characterized in that the hardened Fe-Ni alloy of which the frame is made is a hardened Fe-Ni alloy of the "beryllium-hardened" type, of the "carbide-hardened" type or of the "solid-solution-hardened" type.